^{122}Cs ε decay (21.18 s) 1977Ge03

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	T. Tamura	NDS 108, 455 (2007)	30-Sep-2006

Parent: ^{122}Cs: E=0.0; J$^{\pi}$=1$^+$; T$_{1/2}$=21.18 s *19*; Q(ε)=7220 *30*; %ε+%β^+ decay=100.0

The decay scheme is that proposed by 1977Ge03 on the basis of $\gamma\gamma$-coincidence and Eγ sums. See also ^{122}Cs β^+ decay (3.70 min).

1977Ge03: La(p,spallation) E(p)=600 MeV, MS; semi γ, ce, $\gamma\gamma$-coincidence ceg-coincidence.

Others: γ, β^+ (1975We23); γ (1972Dr06,1969NeZY); $\gamma\gamma(\theta)$ (1979Si11); $\beta^+\gamma$-coincidence (1976DaYR).

^{122}Xe Levels

E(level)†	J$^{\pi}$	E(level)†	J$^{\pi}$	E(level)†	J$^{\pi}$	E(level)†	J$^{\pi}$
0.0	0$^+$	1149.07 *25*	0$^+$	1882.2 *3*		2530.6 *3*	0$^+$,1,2
331.17 *16*	2$^+$	1214.07 *19*	(3)$^+$	2065.4 *3*	2$^+$	2642.2 *3*	1,2
828.35 *20*	4$^+$	1494.90 *23*	2$^+$	2264.3 *5*	0$^+$,1,2		
843.08 *16*	(2$^+$)	1716.3 *3*	1,2	2343.0 *4*	2$^+$		

† E(levels) are based on a least-squares fit to the E(γ's) of 1977Ge03 (evaluator).

ε,β^+ radiations

Evaluator notes that the apparent %(ε+β^+)=0.29 to 828 (J=4$^+$) with log*ft*=7.3 (ΔJ=3, $\Delta\pi$=no) and %(ε+β^+)=0.010 to 1214 (J=(3)$^+$) with log*ft*=6.6 (ΔJ=2, $\Delta\pi$=no) might be too strong.

E(decay)	E(level)	Iβ^+ †	Iε†	Log *ft*	I($\varepsilon+\beta^+$)†	Comments
(4.58×10^3 *3*)	2642.2	0.48 *9*	0.093 *18*	6.28 *9*	0.57 *11*	av Eβ=1619 *15*; εK=0.139 *3*; εL=0.0185 *4*; εM+=0.00502 *11*
(4.69×10^3 *3*)	2530.6	1.17 *16*	0.21 *3*	5.95 *7*	1.38 *19*	av Eβ=1672 *15*; εK=0.129 *3*; εL=0.0171 *4*; εM+=0.00464 *10*
(4.88×10^3 *3*)	2343.0	0.46 *7*	0.070 *11*	6.45 *7*	0.53 *8*	av Eβ=1760 *15*; εK=0.1136 *23*; εL=0.0151 *3*; εM+=0.00409 *9*
(4.96×10^3 *3*)	2264.3	0.44 *7*	0.063 *10*	6.51 *7*	0.50 *8*	av Eβ=1797 *15*; εK=0.1078 *22*; εL=0.0143 *3*; εM+=0.00388 *8*
(5.15×10^3 *3*)	2065.4	0.82 *13*	0.10 *2*	6.34 *8*	0.92 *15*	av Eβ=1891 *15*; εK=0.0949 *19*; εL=0.01257 *25*; εM+=0.00341 *7*
(5.50×10^3 *3*)	1716.3	0.79 *12*	0.078 *12*	6.51 *7*	0.87 *13*	av Eβ=2057 *15*; εK=0.0765 *14*; εL=0.01013 *19*; εM+=0.00275 *5*
(5.73×10^3 *3*)	1494.90	0.65 *16*	0.056 *13*	6.69 *11*	0.71 *17*	av Eβ=2163 *15*; εK=0.0672 *12*; εL=0.00890 *16*; εM+=0.00241 *5*
(6.01×10^3‡ *3*)	1214.07	0.95 *19*	0.068 *13*	6.65 *9*	1.02 *20*	av Eβ=2297 *15*; εK=0.0574 *10*; εL=0.00760 *13*; εM+=0.00206 *4*
(6.07×10^3 *3*)	1149.07	2.9 *4*	0.20 *3*	6.19 *6*	3.1 *4*	av Eβ=2328 *15*; εK=0.0554 *10*; εL=0.00733 *12*; εM+=0.00199 *4*
(6.38×10^3 *3*)	843.08	4.2 *8*	0.24 *4*	6.15 *8*	4.4 *8*	av Eβ=2474 *15*; εK=0.0472 *8*; εL=0.00623 *10*; εM+=0.00169 *3*
(6.39×10^3‡ *3*)	828.35	0.27 *16*	0.016 *9*	7.3 *3*	0.29 *17*	av Eβ=2481 *15*; εK=0.0468 *8*; εL=0.00619 *10*; εM+=0.00168 *3*
(6.89×10^3 *3*)	331.17	35 *4*	1.6 *2*	5.40 *5*	37 *4*	av Eβ=2720 *15*; εK=0.0366 *6*; εL=0.00483 *7*; εM+=0.001311 *19* E(β^+)=5800 *700* (1975We23); 5700 *500* (1976DaYR).
(7.22×10^3 *3*)	0.0	47 *5*	1.8 *2*	5.39 *5*	49 *5*	av Eβ=2880 *15*; εK=0.0314 *5*; εL=0.00414 *6*; εM+=0.001124 *16*

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^{122}Cs ε decay (21.18 s) 1977Ge03 (continued)

ε,β^+ radiations (continued)

† Absolute intensity per 100 decays.
‡ Existence of this branch is questionable.

$\gamma(^{122}Xe)$

Iγ normalization: %(ε+β)=48 *3* to g.s. was estimated by evaluator on the basis of I($\gamma^{\pm}$)/I(331.1γ)=4.02 *53* (1975We23) and theoretical ε/β^+ ratio in decay scheme.

E$_\gamma$	I$_\gamma$ †@	E$_i$(level)	J$^\pi_i$	E$_f$	J$^\pi_f$	Mult.‡	α&	Comments
331.1# *2*	100	331.17	2$^+$	0.0	0$^+$	E2	0.0307	α(K)=0.0254; α(L)=0.00419; α(M)=0.00086; α(N+..)=0.00021
371.0 *2*	0.6 *1*	1214.07	(3)$^+$	843.08	(2$^+$)	(M1)	0.0237	α(K)=0.02047; α(L)=0.00262; α(M)=0.00052; α(N+..)=0.00013
385.6 *3*	0.3 *1*	1214.07	(3)$^+$	828.35	4$^+$	(M1,E2)	0.0203 *12*	α(K)=0.01726; α(L)=0.00244; α(M)=0.00049; α(N+..)=0.00012 Iγ(385γ)/Iγ(882γ) is approximately 1.7 times than the same γ in ^{122}Cs ε decay (3.7 min).
497.1 *2*	2.1 *3*	828.35	4$^+$	331.17	2$^+$	E2	0.00912	α(K)=0.00772; α(L)=0.00112; α(M)=0.00023 Mult.: from ^{122}Te(^{3}He,3nγ),^{110}Pd(^{16}O,4nγ).
512.0 *4*	8.8 *26*	843.08	(2$^+$)	331.17	2$^+$	[M1,E2]	0.00959	α(K)=0.00814; α(L)=0.00109 I$_\gamma$: Iγ deduced from I(ce) of 1977Ge03 and α(K)=0.0081 *10* (M1,E2 (δ=1) theory).
648.2 *3*	0.6 *1*	2530.6	0$^+$,1,2	1882.2				
666.5 *3*	0.6 *1*	1494.90	2$^+$	828.35	4$^+$			
760.0 *5*	0.07 *4*	2642.2	1,2	1882.2				
817.9# *2*	6.5 *4*	1149.07	0$^+$	331.17	2$^+$	Q		
^{x}822.1 *5*	0.13 *6*							
^{x}827.9 *5*	0.20 *6*							
^{x}840.5 *4*	0.4 *1*							
843.0 *2*	4.0 *5*	843.08	(2$^+$)	0.0	0$^+$			
851.1 *4*	0.14 *6*	2065.4	2$^+$	1214.07	(3)$^+$			
873.1 *3*	0.36 *4*	1716.3	1,2	843.08	(2$^+$)			
882.9 *2*	1.7 *3*	1214.07	(3)$^+$	331.17	2$^+$	M1+E2		
^{x}945.4 *4*	0.3 *1*							
1035.9 *3*	1.2 *2*	2530.6	0$^+$,1,2	1494.90	2$^+$			
1038.9 *4*	0.53 *10*	1882.2		843.08	(2$^+$)			
^{x}1148.4 *6*	0.2 *1*							
1163.6 *4*	0.79 *13*	1494.90	2$^+$	331.17	2$^+$			
^{x}1177.0 *6*	0.15 *6*							
1194.0 *7*	0.05 *3*	2343.0	2$^+$	1149.07	0$^+$			
1222.5 *5*	0.36 *10*	2065.4	2$^+$	843.08	(2$^+$)			
1236.8 *5*	0.34 *10*	2065.4	2$^+$	828.35	4$^+$			
1385.2 *3*	1.46 *20*	1716.3	1,2	331.17	2$^+$			
1421.5 *7*	0.13 *6*	2264.3	0$^+$,1,2	843.08	(2$^+$)			
1428.2 *5*	0.34 *13*	2642.2	1,2	1214.07	(3)$^+$			
^{x}1441.3 *7*	0.04 *3*							
^{x}1457.2 *6*	0.22 *4*							
^{x}1460.0 *4*	0.19 *4*							
^{x}1486.6 *5*	0.51 *13*							
1495.5 *4*	1.3 *2*	1494.90	2$^+$	0.0	0$^+$			

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^{122}Cs ε decay (21.18 s) 1977Ge03 (continued)

$\gamma(^{122}Xe)$ (continued)

E_γ	I_γ †@	E_i(level)	J_i^π	E_f	J_f^π
1515.0 *6*	0.27 *4*	2343.0	2+	828.35	4+
1550.9 *7*	0.21 *4*	1882.2		331.17	2+
1734.4 *4*	1.1 *2*	2065.4	2+	331.17	2+
1799.0 *4*	0.79 *13*	2642.2	1,2	843.08	(2+)
x1811.1 *6*	0.46 *9*				
x1836.1 *6*	0.40 *13*				
x1889.8 *7*	0.46 *9*				
1933.0 *5*	0.93 *13*	2264.3	0+,1,2	331.17	2+
2011.3 *6*	0.79 *13*	2343.0	2+	331.17	2+
x2162.5 *7*	0.4 *1*				
2199.1 *7*	1.1 *2*	2530.6	0+,1,2	331.17	2+

† Relative to I(331.1γ)=100.

‡ From α(K)exp. See ^{122}Cs β^+ decay (3.70 min).

\# A_2=+0.2 *2*, A_4=+1.1 *4* from (331.1γ)(817.9γ)(θ) (1979Si11).

@ For absolute intensity per 100 decays, multiply by 0.475 *41*.

& Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

x γ ray not placed in level scheme.

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